

1991  
NORTON SOUND DISTRICT  
SALMON REPORT  
to the  
Alaska Board of Fisheries

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## 1991 NORTON SOUND SALMON FISHERY, A REPORT TO THE BOARD

### Commercial Fishery Overview

The commercial salmon fishing regulations state that the Norton Sound season opens on a date established by emergency order between June 8 and June 20 in Subdistricts 2, 3, 4, 5, and 6 and on July 1 in Subdistrict 1. The Shaktoolik(5) and Unalakleet(6) Subdistricts opened June 17; the Norton Bay(4) Subdistrict opened June 24; the Golovin(2) Subdistrict opened June 20; the Moses Point(3) Subdistrict opened June 24; and the Nome(1) Subdistrict opened August 1. The season closed by regulation on August 31 in Subdistricts 1, 2, and 3, and September 7 in Subdistricts 4, 5, and 6 (Figure 1).

The 1991 Norton Sound commercial salmon harvest totaled 156,789 fish, which was comprised of 6,068 chinook, 203 sockeye, 53,647 coho, 0 pink, and 86,871 chum salmon (Table 1). The chinook harvest was 6% below the previous 5 year average (1986-1990) and 28% below the previous 10 year average (1981-1990). The coho harvest was 60% above the previous 5 year average and 38% above the previous 10 year average. The chum harvest was 7% and 61% below the previous 5 and 10 year averages, respectively. The low chum harvest was due primarily to the poor or diminished chum salmon market in Subdistrict 4. But, weak chum salmon returns and escapement requirements had a greater effect in Subdistricts 1, 2, and 3.

Historically, the Fish River System of Subdistrict 2 produces approximately one-half of the annual commercial chum harvest, however, during the last three years poor returns and low potential harvests have discouraged prospective buyers in this subdistrict. There was no commercial pink or coho salmon harvest in Subdistricts 1, 2, 3, and 4 due to the lack of a market. Historical catch data for the Norton Sound district is presented in Table 1.

A total of 181 CFEC permits were renewed, with 126 actually fished during the 1991 season. The number of participating fishermen this season was the second lowest effort on record since total effort has been documented (1977 to present). The average effort for the previous 10 years has been 151 fishermen. The low effort during the 1991 season can be attributed primarily to the lack of salmon markets during most of the season in the northern subdistricts of Norton Sound.

One domestic seafood buying company purchased the majority of commercially caught salmon in Norton Sound during 1991. Another domestic buyer operated in the Golovin Subdistrict for five periods during the chum run and in Unalakleet during the peaks of the king and coho runs. A third domestic buyer purchased chum salmon at Moses Point during one period. In addition, a few individual fishermen also sold salmon to local restaurant businesses, as permitted under the catcher-seller status.

Commercial fishermen received approximately \$425,430.00 for their catch in 1991. These earnings rank as the second lowest value on record since 1976, and were 19% below the previous 5 year average of \$526,502.00. This low fishery value is attributed to the lack of competitive markets and low prices paid per pound for all salmon species. Prices paid to the fishermen averaged \$0.87 per pound for

chinook, \$0.63 per pound for sockeye, \$0.36 per pound for coho, and \$0.27 per pound for chum salmon. These data are summarized in Table 2.

### Subsistence Fishery Overview

Household subsistence surveys were not conducted during the 1991 season in Norton Sound villages due to budgetary restrictions. Daily surveys of Unalakleet River and ocean subsistence fishermen were conducted during the chinook salmon run. Although total harvests by subsistence fishers were not documented, effort and catch information was used to judge timing and magnitude of the chinook salmon return. The commercial fishery was delayed until it became apparent subsistence needs were being met and chinook salmon were beginning their upstream migration as indicated by the Department of Fish and Game test net in the lower Unalakleet River. There is a growing trend to move subsistence nets from the river mouth out to the ocean in order to prevent large debris loads from spring runoff. It is unclear what affects this change in fishing technique has on chinook salmon escapement.

In the Nome Subdistrict, subsistence harvests are tabulated from the return of permits which are required by regulation in this subdistrict. A preliminary summary of these data are presented in Table 3. A total of 155 salmon subsistence fishing permits were issued to families in the Nome area during the 1991 season. Concern for chum and pink salmon escapement prompted the fishery managers to close salmon fisheries from June 16 until July 24 in about half the Subdistrict and until July 31 in areas of poor escapement. Fishing closures near the town of Nome have caused fishing effort to redistribute to marine waters and to outlying streams. Given the catch rate reported on the permits returned at this time, pink and chum salmon harvests seem to be less than half what was reported in recent years. As a result, escapement goals as a whole in the Subdistrict were met for the first time since 1984. On years with more normal chum migration timing, the subsistence fishing closures enacted during 1991 would have virtually eliminated any chum harvest. The late run timing allowed some harvest after most escapement goals had been met.

### Season Summary by Subdistrict

#### Nome - Subdistrict 1

The commercial salmon season was closed by E.O. on July 1, the day that it normally opens by regulation, and remained closed until August 1. This management action was taken in order to protect the expected low return of chum and pink salmon to the subdistrict. Similar action was taken to close subsistence and sport fishing in the area to improve chum and pink salmon escapement. Once the bulk of the chum had past, subsistence regulations were liberalized to allow the harvest of other species. One hundred fifty-four subsistence permits were issued for the Nome area and harvest data for only 92 fishermen have been reported at this time.

#### Golovin - Subdistrict 2

The Golovin Subdistrict was opened by emergency order June 20 with a fishing schedule of two 48 hour periods per week. Sixteen fishermen sold 49 chinook, 1 sockeye, and 14,839 chum salmon (Table 6). One domestic buyer operated for 5 periods, purchasing fish which were iced, flown to Nome and then on to Anchorage. The season closed by regulation August 31. One catcher seller operated for the same time period. The area manager was preparing to close the commercial chum salmon season when the buyer ceased operation.

#### Moses Point - Subdistrict 3

The Moses Point Subdistrict opened by emergency order on June 24 with a standard two 24 hour period schedule per week (Table 7). The Department's counting tower on the Kwiniuk River showed chum salmon escapement was behind schedule which prompted an E.O. closing the Moses Point subdistrict on June 27. The subdistrict reopened August 1, however no additional salmon were harvested due to lack of market. The season closed by regulation on August 31. Twenty-four fishermen harvested 161 chinook and 804 chum salmon. A domestic buyer flew the salmon out, iced, in-the-round to Fairbanks for processing.

#### Norton Bay - Subdistrict 4

No salmon were commercially harvested in the Norton Bay Subdistrict during the 1991 season due to the lack of a market.

#### Shaktoolik - Subdistrict 5

The Shaktoolik Subdistrict opened by emergency order on June 17. Initial periods were set at 24 hours in length from June 17-21 (periods 1 and 2). On June 24, fishing time was increased to the standard two 48 hour periods per week which continued through the remainder of the season (Table 8). Gill net mesh size was restricted to not more than six inches by E.O. on July 14. Another E.O. closed the subdistrict from July 18 through July 24 to allow additional chum salmon to migrate to spawning areas. One domestic buyer conducted a fly-out operation where fish were flown to Unalakleet, iced, in-the-round, for transport to processing facilities and fresh markets in Anchorage. The Shaktoolik subdistrict season closed by regulation on September 7, however fishing effort actually ended August 21 when fish buying operations ceased.

Twenty-five fishermen harvested 1,324 chinook, 55 sockeye, 11,614 coho, and 31,619 chum salmon for a combined total of 44,612 fish (Tables 4 and 8). The chinook harvest was 15% and 35% below the previous 5 and 10 year average catches, respectively. The coho salmon harvest was 83% above the previous 5 year average catch and 42% above the previous 10 year average catch. The chum salmon harvest was 69% above and 24% above the previous 5 and 10 year average catches, respectively.

## Unalakleet - Subdistrict 6

The Unalakleet Subdistrict receives the most fishing effort in Norton Sound, and has historically not had problems obtaining buyers for their salmon, with the exception of pinks.

The commercial fishing periods, openings, and closures in the Unalakleet Subdistrict were the same as those in the Shaktoolik Subdistrict because of their close proximity (shared boundary) and the difficulty in obtaining timely escapement information. The Fish and Game test net in the Unalakleet River was used as an index of salmon abundance and escapement in both Subdistricts 5 and 6. An additional E.O. closed the Unalakleet River upstream of the mouth of the South River from June 19 until July 8 in order to prevent the drifting of gill nets through king salmon milling areas. Table 9 summarizes commercial catch and effort data by period for the Unalakleet Subdistrict.

A total of 75 fishermen harvested 4,534 chinook, 147 sockeye, 52,033 coho, and 39,609 chum salmon for a combined total of 96,323 fish (Table 4). The chinook salmon harvest was 11% above and 20% below the previous 5 and 10 year average catches, respectively. The coho harvest was 75% above the previous 5 year average catch and 53% above the previous 10 year average catch. The chum salmon harvest was 68% above and 4% above the previous 5 and 10 year average catches, respectively.

One primary domestic buyer operated through nearly the entire season, pulling out August 31. Most of the salmon were flown out iced, in-the-round, to Anchorage bound for fresh markets or for further processing. The Norton Sound Fishermen's Co-op plant did not operate, however, this facility was leased to receive and ice the salmon delivered dockside. A second domestic buyer operated in the Unalakleet Subdistrict during peak periods for chinook and coho salmon. In addition, a few fishermen sold some of their catch to individuals and local businesses as permitted under the catcher-seller regulations.

### Escapement

Table 5 lists aerial survey and tower escapement counts in the major index streams of Norton Sound. In general, weather and survey conditions were good during most of the season. River water levels were moderate following the spring break up then gradually cleared, dropped, and remained low through both the chum and coho runs. Dense smoke reduced visibility on some surveys.

The Nome Subdistrict of Norton Sound received the most intensive survey efforts because salmon stocks local to the Nome area are limited, easily accessed by road system, and exposed to extensive subsistence and sport fishing pressure. Several aerial and boat surveys were conducted on the Nome River.

Chum salmon escapements in the Nome Subdistrict greatly improved over the last couple seasons as the result of drastic management action. The peak count of the Nome River was 3,520 chum. This was the first time since 1984 that the river exceeded it's goal of 2,000 chum salmon.

Chum salmon escapements in the Golovin Subdistrict streams were 15% below their total goal. The Moses Point Subdistrict rivers ( Kwiniuk and Tubutulik) were again well below average. The Kwiniuk River had a preliminary expanded tower count of 18,802 chum salmon with an escapement goal of 25,000. The Tubutulik River had an aerial survey count of 7,085 with an escapement goal of 12,000 chum salmon. It is important to remember that the commercial harvest was also very low in the Moses Point Subdistrict.

Aerial surveys of the Inglutalik and Ungalik Rivers in the Norton Bay Subdistrict counted above average numbers of chum salmon. The Shaktoolik River count in Subdistrict 5 had a slightly low chum count, however large numbers of pinks may of masked counts. Comparative commercial catch data indicate an above average return of chum salmon to the Shaktoolik Subdistrict, therefore the assumption was made that an adequate escapement was reached.

Chum salmon escapement to the Unalakleet River system met their goals. Comparative commercial catch figures and the Department test net catches in the lower Unalakleet River indicated a low return which prompted the closure of two commercial periods. The closure and a late surge of fish resulted in the good numbers.

The Unalakleet and Shaktoolik Subdistricts of Norton Sound are the primary chinook salmon producers, although the Norton Bay, Moses Point and Golovin Subdistricts are gradually increasing chinook returns in recent years. Chinook escapement surveys observed average to above average numbers in most streams throughout the District. The Department test fishery in the Unalakleet River indicated a chinook return which was just below average overall when compared to previous years' test net catches and agrees with the comparative commercial catch data.

Coho salmon are found in nearly all of the chum producing streams throughout the Norton Sound District with the major producers being the Unalakleet and Shaktoolik Subdistricts. Because of the inclement weather normally experienced in this area during August and September, escapement data for all subdistricts is somewhat sketchy. This year, peak coho salmon counts were obtained for most District streams under fair to good viewing conditions.

Overall, coho salmon escapements appeared to be good. Virtually all streams surveyed in Norton Sound were at or above average with the exceptions of Ophir Creek and Eldorado River. The Department's test net and comparative commercial catch data also indicated a strong return.

Pink salmon escapements and returns were variable across Norton Sound. Aerial surveys found low levels of pinks as expected of the low side to a odd/even year cycle in the northern subdistrict streams. However, pinks showed up stronger than expected in the southern streams which are typically on the same cycle (Table 5).



## Management Concerns

Once again chum salmon escapements in the Nome and Moses Point Subdistricts were of concern, or fell short of escapement goals. Escapement goals were reached for most Nome area streams, but only after extreme management actions were taken early in the season. While escapement goals were met, continued strict management will be necessary to achieve harvestable amounts of chum salmon in the future.

The chum salmon return to the Kwiniuk River in the Moses Point Subdistrict was 25% below the escapement goal even though only one 24 hour commercial period was allowed. The spring 1990 Board of Fish imposed a reduced fishing schedule for the subdistrict. In the past, reduced commercial fishing had worked to rebuild the stock from a similar low level. It now appears that it will take several years to rebuild the stock.

The Unalakleet Subdistrict has experienced a black market fishery of king salmon in the river for the past 2 years. In order to maintain escapement, the legitimate commercial fishery has been cut back by delaying the opening and keeping fishing periods to 24 hours in length. Subsistence fishing was also restricted to the lower section of river to prevent the untraditional seining of pools where kings mill. The illegal sale of king salmon as strips will continue to be a matter of concern in upcoming years.

## 1992 Outlook

Forecasting commercial harvests of the various salmon species is difficult in Norton Sound due to differences in market from year to year. Harvests of chinook and coho salmon are expected to be near normal, that is 6-8,000 chinook and 20-40,000 coho. The pink salmon return is expected to be strong throughout Norton Sound, but no commercial market exists. Chum salmon represent the most difficult management problem in 1992. Chum runs in southern Norton Sound are below average, but commercial harvests of 30-60,000 are anticipated. The northern Norton Sound chum stocks are in their most seriously depressed cycle since statehood. Subdistrict 2 commercial harvests will be held to 10,000 chum unless adequate escapement and subsistence harvests can be anticipated. The situation is considerably worse in Subdistricts 1 and 3 where closures in subsistence fishing are anticipated and no commercial or sport harvests of chum salmon are anticipated. Limited subsistence harvests of chum will be allowed incidentally to the subsistence pink salmon harvest in Subdistricts 1 and 3.

Table 1. Commercial salmon catches by species, Norton Sound District, 1961-1991.

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1961	5,300	35	13,807	34,327	48,332	101,801
1962	7,286	18	9,156	33,187	182,784	232,431
1963	6,613	71	16,765	55,625	154,789	233,863
1964	2,018	126	98	13,567	148,862	164,671
1965	1,449	30	2,030	220	36,795	40,524
1966	1,553	14	5,755	12,778	80,245	100,345
1967	1,804	2,379	28,879	41,756	74,818	74,818
1968	1,045	6,885	71,179	45,300	124,499	124,499
1969	2,392	6,836	86,949	82,795	178,972	178,972
1970	1,853	4,423	64,908	107,034	178,218	178,218
1971	2,593	3,127	4,895	131,362	141,977	141,977
1972	2,938	454	45,182	100,920	149,494	149,494
1973	1,918	9,282	46,499	119,098	176,797	176,797
1974	2,951	2,092	148,519	162,267	315,829	315,829
1975	2,393	2	4,593	32,388	212,485	251,861
1976	2,243	11	6,934	87,916	95,956	193,060
1977	4,500	5	3,690	48,675	200,455	257,325
1978	9,819	12	7,335	325,503	189,279	531,948
1979	10,706	31,438	167,411	140,789	350,344	350,344
1980	6,311	40	29,842	227,352	180,792	444,337
1981	7,929	56	31,562	232,479	169,708	441,734
1982	5,892	10	91,690	230,281	183,335	511,208
1983	10,308	27	49,735	76,913	319,437	456,420
1984	8,455	6	67,875	119,381	146,442	342,159
1985	19,491	166	21,968	3,647	134,928	180,200
1986	6,303	233	35,600	41,260	146,912	230,308
1987	7,080	207	24,279	2,260	102,457	136,283
1988	4,096	1,252	37,247	74,604	107,967	225,166
1989	5,707	265	44,091	123	42,625	92,811
1990	8,895	434	56,712	501	65,123	131,665
1991	6,068	203	63,647	0	86,871	156,789

5-Yr Avg <sup>a</sup>	6,416	478	39,586	23,750	93,017	163,247
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10-Yr Avg <sup>b</sup>	8,416	266	46,076	78,145	141,893	274,795
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<sup>a</sup> 1985-1990

<sup>b</sup> 1981-1990

Table 2. Norton Sound salmon dollar value and average price paid to the fishermen, by species, 1991.

Species	Dollar value	Average price paid
Chinook	\$ 93,560.00	0.87
Sockeye	925.00	0.63
Coho	169,018.00	0.36
Chum	161,263.00	0.27
Roe	663.00	3.00
Total	\$ 425,430.00	

Table 3. A comparison of 1991 Nome area subsistence salmon harvest data to an average of 1975-1991.

Waterbody	<u>Permits Issued</u>		<u>Permits Fished</u>		<u>Chum Salmon Harvest</u>		<u>Total Salmon Harvest</u>	
	Average	1991	Average	1991	Average	1991	Average	1991
Nome Subdistrict								
Marine Waters	65.9	76	41.8	48	2,987.6	3,143	5,799.6	3,992
Nome River	50.8	16	32.6	13	563.4	84	3,944.8	343
Snake River	9.4	6	7.0	3	87.7	6	522.8	48
Eldorado/Flambeau	25.7	11	17.2	5	1,646.5	325	2,595.8	539
Bonanza River	4.9	8	3.2	7	129.2	10	356.3	124
Solomon River	4.6	4	2.2	1	34.7	29	228.1	47
Safety Sound	0.6	1	0.4	1	20.8	0	49.5	44
Penny/Cripple	2.7	1	1.2	1	10.7	20	137.4	25
Sinuk River	4.4	0	1.9	0	47.7	0	157.3	0
Unknown	4.8	6	0.2	0	34.6	0	75.8	0
Port Clarence Dist.	6.1	26	2.3	14	73.4	98	132.7	275
Totals	180	155	110	93	5,636	3,715	14,000	5,437

Table 4. Norton Sound salmon summary by subdistrict, 1991.

s.d.	No. of Permits	Chinook / lbs	Sockeye / lbs	Coho / lbs	Roe / lbs	Chum / lbs	Total / Total lbs
1	0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
2	16	49 / 831	1 / 7	0 / 0	0 / 0	14839 / 107396	14889 / 108234
3	24	161 / 2824	0 / 0	0 / 0	0 / 0	804 / 6011	965 / 8835
4	0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0
5	25	1324 / 21505	55 / 430	11614 / 86801	0 / 0	31619 / 219386	44612 / 328122
6	75	4534 / 82381	147 / 1032	52033 / 382694	0 / 221	39609 / 264479	96323 / 730801
Total	126 <sup>a</sup>	6068 / 107541	203 / 1469	63647 / 469495	0 / 221	86871 / 597272	
Avg. wt.		17.7	7.2	7.4		6.9	

<sup>a</sup> Some fishermen fished more than one subdistrict.

Table 5. Aerial survey counts of Norton Sound streams and associated chum salmon escapement goals, 1991.

Stream Name	Chinook	Coho	Sockeye	Pink	Chum	Chum Goal
Grand Central R.			1,520			
Salmon L.			4,173			
Pilgrim R.	5			103		
Sinuk R.	3	701		14,680	5,420	4,500
Glacial L.			2,141			
Cripple R.		195		470	2,090	
Penny R.		60		300		
Snake R.				190	772	1,000
Nome R.	9	611		4,690	3,520	2,000
Flambeau R.	2			570	1,564	3,250
Idorado R.	76	98		1,590	5,755	5,250
Bonanza R.				2,980	1,520	1,500
Solomon R.		171		3,640	830	550
Fish R.	58			51,190	10,470	17,500
Niuluk R.	24	1,783		37,410	10,660	8,000
Boston R.	152			3,210	2,550	2,500
Kwiniuk R.		809				
Tubutulik R.	661			26,870	7,085	12,000
Inglutalik R.	551			94,100	16,250	8,500
Ungalik R.	151	418		152,900	10,050	2,500
Shaktoolik R.	730	3,427		208,070	7,405	11,000
Unalakleet R.	1,244	7,396		44,300	4,225	
North R.	656	2,510		118,720	2,435	2,000
Old Woman R.	389	1,530		1,964	990	100
Kogok R.		177		620	1,350	
Pikmiktalik R.	154	1,202		2,480	1,360	

Table 6. Commercial salmon catches from Golovin, subdistrict 2, Norton Sound, set gill nets, 1991.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Sockeye	CPUE	Chum	CPUE	Chinook	CPUE	Sockeye	CPUE	Chum	CPUE
1	6/28-6/22	48	3	7	0.05	1		586	4.07	7	0.05	1		586	4.07
2	6/24-6/26	48	10	8	0.02	0		2,557	5.33	15	0.02	1		3,143	5.04
3	6/27-6/29	48	11	21	0.04	0		2,927	5.54	36	0.03	1		6,070	5.27
4	7/01-7/03	48	14	11	0.02	0		4,920	7.32	47	0.03	1		10,990	6.03
5	7/04-7/06	48	13	2	+	0		3,849	6.17	49	0.02	1		14,839	6.06
6	7/08-7/10	48	0	No Buyer						49	0.03	1		14,839	5.83
7	7/11-7/13	48	0	No Buyer						49	0.03	1		14,839	5.83
8	7/15-7/17	48	0	No Buyer						49	0.03	1		14,839	5.83
9	7/18-7/20	48	0	No Buyer						49	0.03	1		14,839	5.83
10	7/22-7/24	48	0	No Buyer						49	0.03	1		14,839	5.83
11	7/25-7/27	48	0	No Buyer						49	0.03	1		14,839	5.83
12	7/29-7/31	48	0	No Buyer						49	0.03	1		14,839	5.83
13	8/01-8/03	48	0	No Buyer						49	0.03	1		14,839	5.83
14	8/05-8/07	48	0	No Buyer						49	0.03	1		14,839	5.83
15	8/08-8/10	48	0	No Buyer						49	0.03	1		14,839	5.83
16	8/12-8/14	48	0	No Buyer						49	0.03	1		14,839	5.83
17	8/15-8/17	48	0	No Buyer						49	0.03	1		14,839	5.83
18	8/19-8/21	48	0	No Buyer						49	0.03	1		14,839	5.83
19	8/22-8/24	48	0	No Buyer						49	0.03	1		14,839	5.83
20	8/26-8/28	48	0	No Buyer						49	0.03	1		14,839	5.83
21	8/29-8/31	24	0	No Buyer						49	0.03	1		14,839	5.83

No coho salmon were sold.

Total hours actually fished = 240

Total number of permits used = 16

Table 7. Commercial salmon catches from Moses Point, subdistrict 3, Norton Sound, set gill nets, 1991.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Pink	CPUE	Chum	CPUE	Chinook	CPUE	Pink	CPUE	Chum	CPUE
1	6/24-6/25	24	24	161	0.28			804	1.4	161	0.28			804	1.4
2	6/27-6/28	0	Closed by E. O.							161	0.28			804	1.4
3	7/01-7/02	0	Closed by E. O.							161	0.28			804	1.4
4	7/04-7/05	0	Closed by E. O.							161	0.28			804	1.4
5	7/08-7/09	0	Closed by E. O.							161	0.28			804	1.4
6	7/11-7/12	0	Closed by E. O.							161	0.28			804	1.4
7	7/15-7/16	0	Closed by E. O.							161	0.28			804	1.4
8	7/18-7/19	0	Closed by E. O.							161	0.28			804	1.4
9	7/22-7/23	0	Closed by E. O.							161	0.28			804	1.4
10	7/25-7/26	0	Closed by E. O.							161	0.28			804	1.4
11	7/29-7/30	0	Closed by E. O.							161	0.28			804	1.4
12	8/01-8/03	48	Reopen by E. O.	No Buyer						161	0.28			804	1.4
13	8/05-8/07	48	No Buyer							161	0.28			804	1.4
14	8/08-8/10	48	No Buyer							161	0.28			804	1.4
15	8/12-8/14	48	No Buyer							161	0.28			804	1.4
16	8/15-8/17	48	No Buyer							161	0.28			804	1.4
17	8/19-8/21	48	No Buyer							161	0.28			804	1.4
18	8/22-8/24	48	No Buyer							161	0.28			804	1.4
19	8/26-8/28	48	No Buyer							161	0.28			804	1.4
20	8/29-8/31	48	No Buyer							161	0.28			804	1.4

No coho salmon were sold.

Total hours actually fished = 24

Total number of permits used = 24



Table 8. Commercial salmon catches from Shaktoolik, subdistrict 5, Norton Sound, set gill nets, 1991.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort					Cumulative Catch and Catch Per Unit Effort				
				Chinook CPUE	Sockeye CPUE	Coho CPUE	Chum CPUE		Chinook CPUE	Sockeye	Coho CPUE	Chum CPUE	
1	6/17-6/18	24	19	259 0.57			73 0.16		259 0.57			73 0.16	
2	6/20-6/21	24	19	373 0.82			114 0.25		632 0.69			187 0.21	
3	6/24-6/26	48	20	285 0.30	7 0.01		1,743 1.82		917 0.49	7		1,930 1.83	
4	6/27-6/29	48	21	285 0.28	8 0.01		5,806 5.76		1,122 0.39	15		7,736 2.69	
5	7/01-7/03	48	18	91 0.11	0 0.00		2,796 3.24		1,213 0.32	15		10,532 2.81	
6	7/04-7/06	48	16	46 0.06	2 0.00		4,301 5.60		1,259 0.28	17		14,833 3.29	
7	7/08-7/10	48	16	24 0.03	8 0.01		5,690 7.41		1,283 0.24	25		20,523 3.89	
8	7/11-7/13	48	19	18 0.02	7 0.01	1 0.00	6,169 4.57		1,301 0.21	32	1	24,692 3.99	
9	7/15-7/17	48	15	8 0.01	1 0.00	2 0.00	1,299 1.80		1,309 0.19	33	3	25,991 3.76	
10	7/18-7/20	0	0	Closed by E.O.					1,309 0.19	33	3	25,991 3.76	
11	7/22-7/24	0	0	Closed by E.O.					1,309 0.19	33	3	25,991 3.76	
12	7/25-7/27	48	15	1 0.00	4 0.01	311 0.43	1,405 1.95		1,310 0.17	37	314 0.44	27,396 3.59	
13	7/29-7/31	48	12	0 0.00	5 0.01	1,173 2.04	846 1.47		1,310 0.16	42	1,487 1.15	28,242 3.44	
14	8/01-8/03	48	15	3 0.00	1 0.00	1,518 2.11	791 1.10		1,313 0.15	43	3,005 1.49	29,033 3.25	
15	8/05-8/07	48	18	1 0.00	5 0.01	2,392 2.77	1,072 1.24		1,314 0.13	48	5,397 1.87	30,105 3.87	
16	8/08-8/10	48	17	1 0.00	1 0.00	2,967 3.64	850 1.04		1,315 0.12	49	8,364 2.26	30,955 2.92	
17	8/12-8/14	48	17	1 0.00	2 0.00	1,001 1.23	237 0.29		1,316 0.12	51	9,365 2.08	31,192 2.73	
18	8/15-8/17	48	12	0 0.00	2 0.00	1,381 2.40	251 0.44		1,316 0.11	53	10,746 2.11	31,443 2.62	
19	8/19-8/21	48	9	8 0.02	2 0.00	868 2.01	176 0.41		1,324 0.11	55	11,614 2.10	31,619 2.54	
20	8/22-8/24	48	0	No Buyer					1,324 0.11	55	11,614 2.10	31,619 2.54	
21	8/26-8/28	48	0	No Buyer					1,324 0.11	55	11,614 2.10	31,619 2.54	
22	8/29-8/31	48	0	No Buyer					1,324 0.11	55	11,614 2.10	31,619 2.54	
23	9/02-9/04	48	0	No Buyer					1,324 0.11	55	11,614 2.10	31,619 2.54	
24	9/05-9/07	48	0	No Buyer					1,324 0.11	55	11,614 2.10	31,619 2.54	

No pink salmon were sold.

Total hours actually fished = 672

Total number of permits used = 25

Cumulative coho boat hours began when 100 coho were caught.

Table 9. Commercial salmon catches from Unalakleet, subdistrict 6, Norton Sound, set gill nets, 1991.

Period Number	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort							
				Chinook	CPUE	Sockeye	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Sockeye	Coho	CPUE	Chum
1	6/17-6/18	24	46	1,098	0.99		0.00			135	0.12	1,098	0.99			135	0.12
2	6/20-6/21	24	47	582	0.52		0.00			82	0.07	1,680	0.75			217	0.10
3	6/24-6/26	48	52	979	0.39	2	0.00			605	0.24	2,659	0.56	2		822	0.17
4	6/27-6/29	48	56	1,074	0.40	2	0.00			2,569	0.96	3,733	0.50	4		3,391	0.46
5	7/01-7/03	48	51	551	0.23	1	0.00			2,299	0.94	4,284	0.43	5		5,690	0.58
6	7/04-7/06	48	29	101	0.07	0	0.00			2,655	1.91	4,385	0.39	5		8,345	0.74
7	7/08-7/10	48	33	43	0.03	4	0.00			3,118	1.97	4,428	0.34	9		11,463	0.89
8	7/11-7/13	48	31	34	0.02	22	0.01			4,892	3.29	4,462	0.31	31		16,355	1.14
9	7/15-7/17	48	34	15	0.01	19	0.01	13	0.01	6,172	3.78	4,477	0.28	50	13	22,527	1.41
10	7/18-7/20	0	0	CLOSED BY E.O.								4,477	0.28	50	13	22,527	1.41
11	7/22-7/24	0	0	CLOSED BY E.O.								4,477	0.28	50	13	22,527	1.41
12	7/25-7/27	48	36	5	0.00	8	0.00	1,606	0.93	4,438	2.57	4,482	0.25	58	1,619	26,965	1.52
13	7/29-7/31	48	43	10	0.00	13	0.01	3,061	1.48	2,769	1.34	4,492	0.23	71	4,680	29,734	1.51
14	8/01-8/03	48	43	0	0.00	6	0.00	4,416	2.14	2,358	1.14	4,492	0.21	77	9,096	32,092	1.47
15	8/05-8/07	48	45	7	0.00	6	0.00	9,000	4.17	2,217	1.03	4,499	0.19	83	18,096	34,309	1.43
16	8/08-8/10	48	45	2	0.00	6	0.00	9,161	4.24	1,916	0.89	4,501	0.17	89	27,257	36,225	1.39
17	8/12-8/14	48	51	4	0.00	8	0.00	6,533	2.67	945	0.39	4,505	0.16	97	33,790	37,170	1.30
18	8/15-8/17	48	47	1	0.00	6	0.00	5,164	2.29	879	0.39	4,506	0.15	103	38,954	38,049	1.23
19	8/19-8/21	48	46	10	0.00	8	0.00	6,634	3.00	976	0.44	4,516	0.14	111	45,588	39,025	1.18
20	8/22-8/24	48	32	3	0.00	3	0.00	1,939	1.26	286	0.19	4,519	0.13	114	47,527	39,311	1.14
21	8/26-8/28	48	33	12	0.01	15	0.01	3,069	1.94	202	0.13	4,531	0.13	129	50,596	39,513	1.09
22	8/29-8/31	48	29	3	0.00	11	0.01	1,180	0.85	92	0.07	4,534	0.12	140	51,776	39,605	1.05
23	9/02-9/04	48	2	0	0.00	7	0.07	109	1.14	4	0.04	4,534	0.12	147	51,885	39,609	1.05
24	9/05-9/07	48	2	0	0.00	0	0.00	148	1.54	0	0.00	4,534	0.12	147	52,033	39,609	1.05

No pink salmon were sold.

Total hours fished = 1,008

Total number of permits used = 75

Cumulative coho boat hours began when 100 coho were caught.

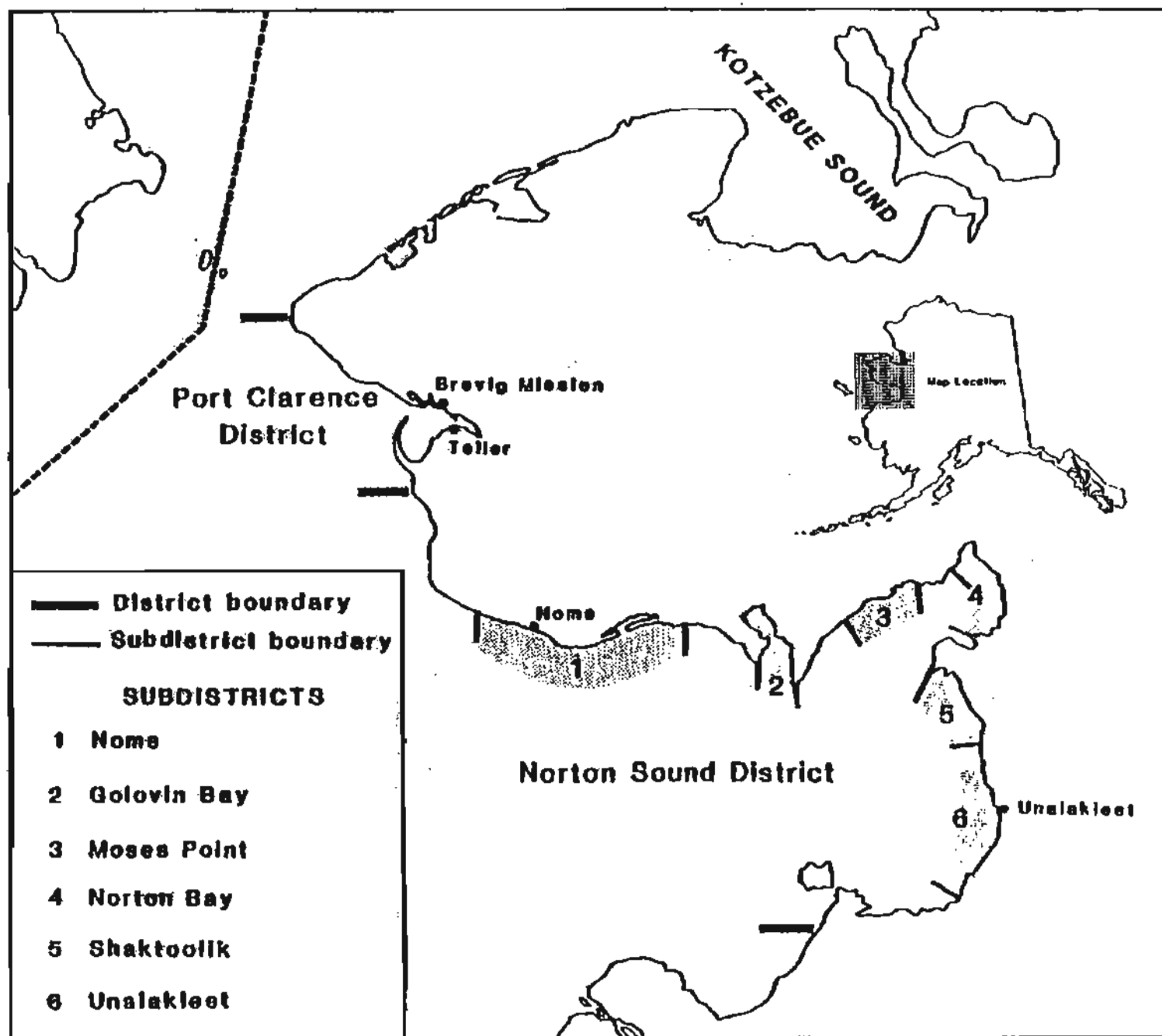


Figure 1. Norton Sound commercial salmon fishing subdistricts.

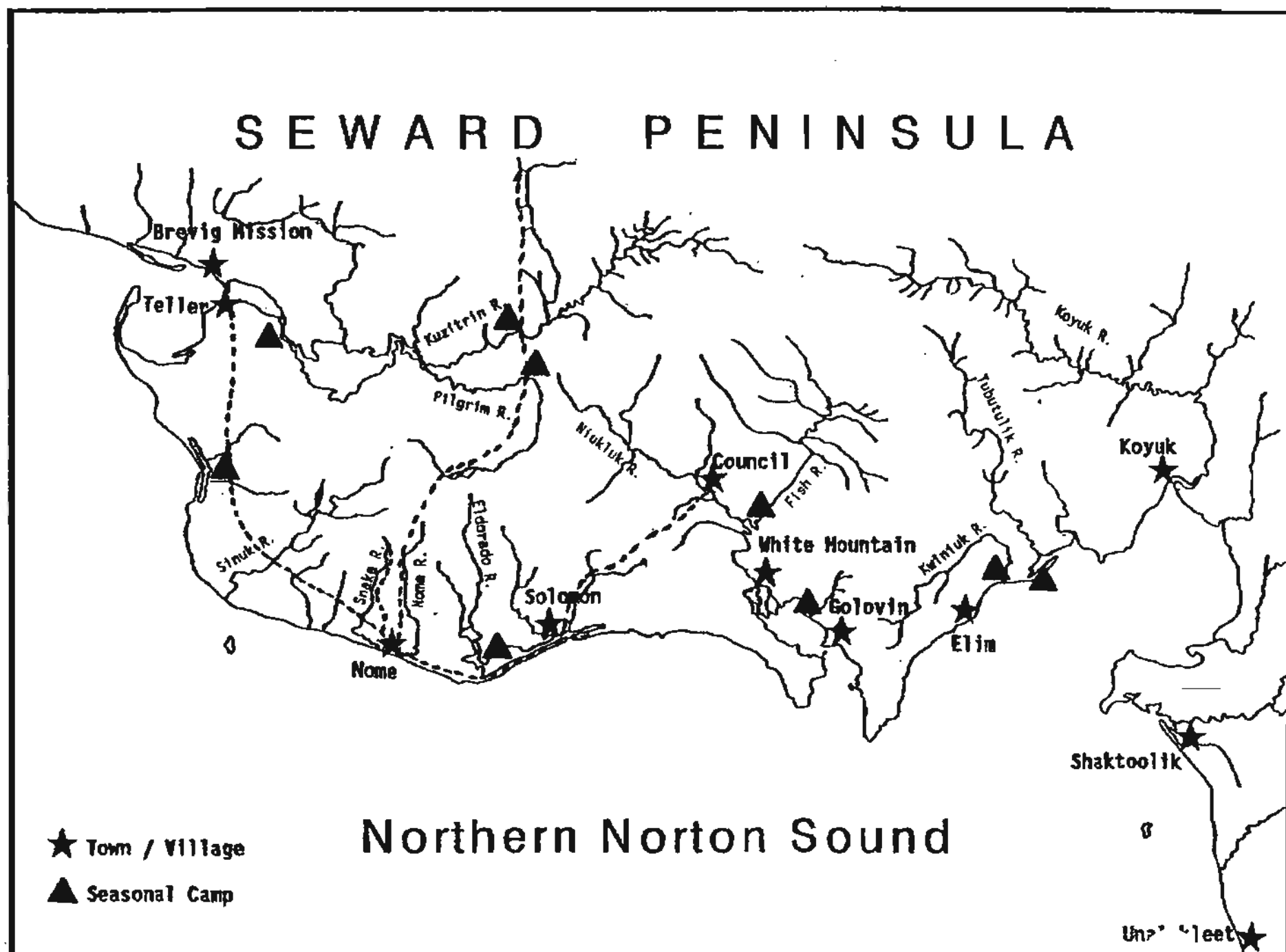


Figure 2. Northern Norton Sound subsistence fishing sites.

